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CASE NO. 10225/64 (A27)

THE INTERNATIONAL SEARCHING AUTHORITY  
PATENT COOPERATION TREATY

Applicant: Altair Nanomaterials, Inc. )  
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International )  
Application No.: PCT/US03/038235 )  
 )  
International )  
Filing Date: 02/12/2003 )  
 )  
For: RARE EARTH COMPOSITIONS AND )  
STRUCTURES FOR REMOVING )  
PHOSPHATES FROM WATER )

AMENDMENTS UNDER ARTICLE 19 AND RULE 46

International Bureau of WIPO  
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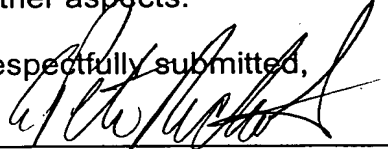
Dear Sir:

This provides an amendment to the claims pursuant to Article 19. New pages 11 thru 13 are attached. The following amendments have been made. Original claims 1 and 2 have been amended so that they are presented as a "use" claim. The dependent claims have been amended to conform to the independent claims.

The dependency of claim 14 was changed.

New claims 21-23 are presented to further define the method of making the compound. The claims remain unchanged in all other aspects.

Respectfully submitted,

  
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What is claimed:

1. Use of a rare-earth compound selected from the group consisting of rare earth anhydrous oxycarbonate and rare earth hydrated oxycarbonate, with a surface area of at least 10 m<sup>2</sup>/g for making a composition suitable for the removal of phosphate from  
5 water.
2. Use of a rare-earth compound in the form of agglomerates of 1 to 1000 μm in size with the compound selected from the group consisting of rare earth anhydrous oxycarbonate and rare earth hydrated oxycarbonate for making a composition suitable  
10 for the removal of phosphate from water.
3. The use according to claim 1 or 2 wherein the rare earth is selected from the group consisting of lanthanum, cerium, and yttrium.
- 15 4. The use according to claim 1 or 2 where the rare earth is lanthanum.
5. The use according to claim 1 or 2 where the compound is a particle with a porous structure.
- 20 6. The use according to claim 5 where the porous structure is made by total evaporation of a rare-earth salt solution followed by calcination.
7. The use according to claim 6 where the total evaporation step is conducted in a spray dryer.  
25
8. The use according to claim 6 where the evaporation temperature is between about 120° and 500°C.
9. The use according to claim 6 where the calcination temperature is between about  
30 400° and about 1200 °C.

10. The use according to claim 6 where the porous particles have a size between 1 and 1000  $\mu\text{m}$ .
11. The use according to claim 10 where the particles are formed from individual  
5 crystals having a size between 20 nm and 10  $\mu\text{m}$ .
12. The use according to claim 7 where the product is made of spheres or parts of spheres.
- 10 13. The use according to claim 6 wherein the rare earth salt solution is a rare earth acetate.
14. The use according to claim 5 wherein the rare earth salt solution is neutralized with sodium carbonate, followed by washing, filtering and drying.
- 15 15. The use according to claim 14 wherein the neutralization process takes place at a temperature between 30° and 90°C.
16. The use according to claim 15 wherein the drying takes place at a temperature of  
20 about 100° to 120°C.
17. The use according to claim 16 wherein the drying takes place for a period of about 1 to 5 h.
- 25 18. A method of preventing algal growth in swimming pools and other water systems comprising providing an effective amount of the composition of claim 1 or 2.
19. The method of claim 17 wherein the composition exhibits a low solubility in water.
- 30 20. The method of claim 17 wherein the composition is added in the filtration system of a swimming pool.

21. The use according to claim 5 wherein the compound is formed from a  $\text{LaCl}_3$  solution that has been heated to a temperature between  $30^\circ$  and  $90^\circ$  C.
- 5 22. The use according to claim 21 wherein sodium carbonate is added to the heated  $\text{LaCl}_3$  solution to form a precipitate.
23. The use according to claim 22 wherein the precipitate is heated at a temperature between  $100^\circ$  and  $120^\circ$  C.